the most threatening signs appeared, the mercurial barometer sank to 29·60. On the 14th similar indications showed themselves at St. Thomas—rain, squalls, and thunder; while on the night of the 15th the barometer suddenly fell to 29·70, and a violent gust of wind from the north caused many of the natives to barricade their windows in anticipation of the worst. This state of things lasted till next day at noon, when the mercury rose and the sky cleared.

But by this time the cyclone, now only about a hundred miles to the east of the islands, had fully formed itself; and henceforth its course was only too clearly marked by the damage it caused among the shipping. From August 17 to 24 it passed north, with a westerly inclination, till it fell in with the course of the Gulf Stream, above Florida, and then followed that line, but gradually nearing the coast, up to Nova Scotia, where the ravage was tremendous, upwards of a hundred vessels having been either dismasted, or rendered total wrecks. Further north the cyclone seems to have expanded into an ordinary storm and disappeared.

These particulars I gathered from the captains of the injured vessels, some of which took refuge in this port. They are illiterate men, and not capable of furnishing exact details; but all agreed in describing the wind-current as having been from north to south by west, and so back by east to north; the lowest barometric indication I heard speak of was 29°.

The second cyclone originated in the Carribæan Sea itself, to the west of Barbadoes. Telegrams of threatening weather dated September 25 reached us at St. Thomas; and on the 26th the aspect of matters here was gloomy; the sky murky, especially to the south, with continued flashes of lightning, and a very heavy sea. But the hurricane did not touch Santa Cruz; its first long-shore visit having been made on the 28th at Haiti, where several small ships were lost, and much mischief done. Jamaica escaped; but on the 30th the whole southern coast of Cuba was ravaged from east to west, and many lives lost by sea and shore. From Cuba the cyclone continued to pass west till it reached the Mexican coast, which it skirted, then turned east, touching Havanna on October 4, Florida on the 7th, and then, following the Gulf Stream, was lost in mid-ocean. Its greatest fury was in the Gulf of Mexico itself, where the injury done to the shipping almost equalled that caused off Halifax by the gale of August 24.

Some disquietude has also been caused here at St. Thomas by the frequency of slight earthquake shocks, of which I counted five within a period of forty days. The two strongest occurred on July 22 and August 12; in both instances the movement appeared to pass from east to west; it was accompanied by a distinct rumbling sound. The shock of August 12 occurred at 8.15 P.M., and was within a few seconds followed by another, but slighter. In two instances, June 16 and August 27, a slight shock at this island had been preceded, about an hour and a half before, by a stronger one at Jamaica: so that the general direction of the movement must have been contrary to the apparent surface vibration from west to east.

I may add that the whole of this island is manifestly undergoing a gradual upheaval, as appears by the wave-worn rocks of recent date, but already two or three feet above water mark; sea-shells and corals left dry, and similar indications. Hence the artificial channel opened, for purposes of cleansing by means of the current thus established, between the south-western extremity of the harbour and the outer sea, and which is in itself a clean cut, twenty feet wide, through a narrow band of rock, has, since 1870, when it first was made, lost so much of its depth as scarcely to allow of boat-passage; and threatens at no distant period to become absolutely useless.

W. G. PALGRAVE

NOTES

THE well-known German serial, Poggendorff's *Annalen der Physik und Chemie* has now been in existence fifty years, and we are glad to see that practical recognition has just been taken of the striking fact that it has, during this long period, been under the sole editorial direction of Prof. Poggendorff, while printed and published by the same house in Leipzic. It was agreed, a short time since, by a number of friends of the learned professor, that they should relieve him of his editorial duties for one volume, and that this should be presented to him in honour of the occasion, as a "Jubelband," or Jubilee volume. The importance of the work done by M. Poggendorff and his *collaborateurs*, during half a century, through the *Annalen*, is sufficiently obvious to any who have taken an interest in the progress of physical science in recent years. The serial well reflects that enterprise, plodding industry, and philosophical insight, which mark original research in Germany; and the 156 volumes that have appeared (six of these supplementary) constitute an invaluable storehouse for any one desiring to prosecute new lines of investigation in the wide field of physics. We learn from the preface to the Jubilee volume (which we hope to notice at greater length) that the entire number of papers published in the *Annalen* hitherto is 8,850; and among the 2,167 authors who have contributed to its pages, we find the eminent names of Liebig, Magnus, Berzelius, Rammelsberg, Rose, Faraday, Brewster, Becquerel, Regnault, and many others. A work of this kind, as is truly remarked, unites those engaged in similar researches all over the world, into one large brotherhood of mutual assistance and regard. We congratulate the learned editor on the completion of such a long term of arduous and honourable service to Science, and heartily join in the wish that this Jubilee volume may be followed by many others edited by the "Jubilar" himself.

WE are given to understand that preliminary negotiations are on foot for the establishment of a central establishment for Ocean Meteorology in Germany. We may hope that when such a step is in contemplation, the work done by Herr von Freeden, who has for the last seven years conducted the Norddeutsche, lately called the Deutsche Seewarte, at Hamburg, will meet with its full measure of recognition. The establishment in question has been maintained at the sole expense of the town of Hamburg, and has risen steadily from a small beginning to its present state of thorough efficiency, thanks, in great measure, to the energy of its director.

IN the review of Belt's "Naturalist in Nicaragua" by Mr. Wallace, p. 221, reference is made to the theory of the origin of cyclones propounded by the author in terms which might lead our readers to think that his views have been entirely unnoticed. Such is however not the case, and our attention has been drawn to Prof. Reye's work "Die Wirbelstürme, &c., in der Erd-Atmosphäre, mit Berücksichtigung der Stürme in der Sonnen-Atmosphäre" (Hanover 1872), in which Mr. Belt's views are discussed at some length, with an expression of regret that so little attention has been attracted to them.

THE Turners' Company of the City of London have acknowledged the debt which their Art owes to pure scientific research, by presenting the freedom and livery of that Company to Dr. John Phillips, F.R.S., Professor of Geology in the University of Oxford, in recognition of his introduction into architecture of the various materials which constitute the rocks of England. Mr. John Jones, a member of the livery, said the City of London was always willing to bestow its honours on successful generals, conspicuous statesmen, and devoted patriots —and the tributes were honourable to both sides—but that was the very first occasion on which they had offered the like distinction to a patient, observant, and reflecting student of nature. In doing so they, at the same time, offered their thanks to the University of Oxford for having included physical science in its curriculum of education, and they celebrated, so to speak, the alliance in that city of art and science.

The recent appearance of a French translation of the last edition of Prof. Haeckel's world-known "Natürliche Schöpfungs-Geschichte;" or, "History of the Creation of Organised Beings," will give a larger number of students the opportunity of mastering its valuable contents. How is it that no translation has yet appeared in our own language?

Men of Science will be glad to learn that the Premier has recommended to the Queen for a pension of 100*l.* on the Civil List Mrs. C. L. Basevi, the mother of Captain Basevi, who lost his life on the Thibet frontier of India, whilst engaged in exploring the mountain passes, and pursuing other scientific inquiries.

Dr. John Anderson, Director of the India Museum of Calcutta, is at present in this country on two years' leave of absence. He is, however, devoting his holiday to working out the results of the Yunan Expedition, to which he was attached as naturalist three years ago. The Linnean Society has undertaken their publication, which will embrace a full description of the anatomy of the fresh-watar Dolphin of the Ganges (*Platanista gangetica*), as also of the still rarer fresh-water Cetacean of the Irawady *Orcella flumenalis*.

On Friday, April 10, M. Leverrier gave a *soirée* at the National Observatory of Paris, in honour of the delegates of the French Scientific Societies. The weather was unfavourable, but the exhibition of scientific instruments was very successful indeed. Many new electrical apparatus were exhibited for the first time. No gaslight was used; an electrical lamp by Perrin being the only lighting medium. A lecture was delivered by M. Wolf, on phenomena of polarisation, illustrated by optical experiments by Dubosc.

The Commissioners for the Construction of a Universal Metre are at present superintending the fabrication of the definitive standards, which will be distributed amongst the several Government delegates to the International Congress. The operations are executed at Paris, in the laboratory of the School of Mines.

M. Alluard, the originator and director of the Puy de Dome Observatory, has announced that an inauguration will take place next September. Invitations will be sent to England as well as throughout France. The cost of the building will be something more than 4,000*l.*, and the work is fast advancing. The Puy de Dome Observatory will be connected by an electric telegraph with another observatory built at Clermont, and which is already in operation; the difference of level between the two stations will be more than 4,000 ft. When excavating on the top of the mountain it was discovered that a large building about 80 yards in breadth had existed on the spot. It is supposed to have been a Roman fortress and temple; a number of Roman medals were discovered.

M. Colladon, the Geneva physicist, has published an essay on the subject of turning poplars into lightning conductors. He proposes to insert in the lower part of the trunk a metallic rod, which he connects with the earth by a chain, so that the fluid cannot leave the tree to dart at any object placed within a short distance, which at present is very often the case.

M. Sainte-Claire Deville, appears to have been again successful in his weather predictions. We shall give details in our next on the important question.

French officials are organising a fusion between the postal and telegraphic officials.

A remarkable instance of the rapid spread of a new pest is furnished by the history of *Puccinia Malvacearum*, a fungus parasitic on various plants belonging to the natural order Malvaceæ. Its native country is probably Chili, where it was discovered by Bertero on *Althæa officinalis.* Its first appearance in Europe was in April 1873, on *Malva sylvestris*, in the neighbourhood of Bordeaux, and in August it had extended to several other plants of the same order in the botanic gardens of that town, but, singularly enough, was not found on *Althæa officinalis*, several other nearly allied genera being also exempt from its attacks. In Germany it was first discovered in October, while in this country it was detected in the summer of 1873, nearly simultaneously in many widely-dispersed localities, as Exeter, Salisbury, Chichester, Shere in Surrey, the neighbourhood of London, Eastbourne, Pevensey, Sandown in the Isle of Wight, and Lynn, and threatens to be exceedingly destructive to the hollyhocks.

Two remarkable instances of protective mimicry have lately been described by Prof. Gerstaecker, both among parasitic Hymenoptera, and having apparently for their object to facilitate the access of the parasite to the nest of the host for the purpose of laying its eggs. *Crypturus argiolus* differs altogether in colour and marking from the allied species of Ichneumonidæ, and assumes even in the minutest details those of the wasp *Pollistes gallica*, on which it is parasitic. To so great an extent is the mimicry carried out that even variations characteristic of particular districts are reproduced, the area of distribution of both insects being very wide. In the second case it is the colour and markings of a wasp, *Vespa germanica*, that are imitated by its parasite *Conops diadematus*.

At the east end of the Palm-House at Kew there is a fine specimen of the rare *Agave univittata* coming into flower. Near it stand the still stately flowering stems of two allied plants, *Agave jacquiniana* and *Fourcroya gigantea*.

The French conscription enables us to study annually the composition of the growing generation. Last year from about 300,000 young men passing the examination for recruiting the army, 16,000 were discharged on account of having lost their brothers or having had them wounded in the war, 11,400 as being sons or grandsons of widows, or of people above seventy years of age, 1,600 elder brothers of orphans, 16,000 as not being strong enough, 10,000 for lameness, 8,000 not tall enough, 4,000 from having defects of the bowels, 3,000 of the eyes, 2,700 organs of generation, 2,000 bad teeth, 1,000 as being mute, &c., 1,200 epileptics, 600 deaf, 80 blind, 1,000 phthisic, &c.; in all, 89,000 were left out of the contingent.

In the report furnished us by the Secretary of the Anthropological Institute (vol. ix. p. 345) of Mr. Distant's paper On the Mental Differences between the Sexes, the author is said to have referred to the "now moderately well established fact that in primitive races the *hair* of women approximates more closely to that of man than obtains in a higher state of civilisation." Mr. Distant in his paper referred to the *brain*, not to the *hair*.

A quicksilver mine is said to have been discovered at Exeter.

M. Gaston Tissandier is publishing at Hachette's an excellent popular work on "Photography," with numerous illustrations. One of them shows Charles, the inventor of the gas balloon, photographing the silhouette of one of his pupils on a paper sensitised with one of the salts of silver, more than twenty years before the discovery of Daguerre.

In his recent paper On the Placentation of the Sloths, published in the Transactions of the Royal Society of Edinburgh, Prof. Turner has done much to diminish the value of placental characters in the classification of the higher mammalia. In *Cholœpus hoffmanni* the placenta is dome-like, multilobate and genuinely deciduate, more like that found in the Primates and Man than in any other order, so much so that the author remarks "from the point of view of the descent hypothesis, it is possible that between the Sloths and the Lemurs genealogical relations may exist," and "now that I have called attention to the evidence of affinity with these higher mammals it is not improbable that other features of resemblance may in time be recognised."

BESIDES the ornithological papers which the late Mr. H. D. Graham contributed to the *Naturalist*, he left in the form of manuscript notes the larger and more interesting portion of the ornithological work which he had undertaken in the islands of Iona and Mull during the latter part of his life. These, together with the papers referred to, are being prepared for publication by Mr. R. Graham, to whom the whole of Mr. Graham's ornithological correspondence was originally addressed.

WE learn from the *Times* that M. Giard, Professor of Natural History at Lille, has been making an interesting inquiry into the zoology of the French shore of the Straits of Dover. Many uncommon species of crustaceans, ascidians, and mollusca have been obtained, which will be fully described before the Scientific Congress which is to be held at Lille during the ensuing summer.

WE are glad to see that Government have at last begun to carry out their agreement with the Trustees of the Bethnal Green Museum, by laying out the vacant space around the Museum in gardens for the recreation of the people.

IN the House of Commons, on Tuesday, Mr. Cowper-Temple obtained leave to bring in a Bill to remove doubts as to the powers of the University of Scotland to admit women as students, and to grant degrees to women.

THE month of April is a famous one in the annals of the French Academy for centenary anniversaries. M. Biot was born in April 1774, almost the same day when Louis XIV. died. M. Biot was a member of the Academy of Sciences and Academy of Inscriptions. It was also in this month that Maupertuis published the first French mathematical essay in which the Newtonian theory of attraction was accepted. Lavoisier was engaged in making observations on solar heat with an immense lens at the cost of one of the richest financiers of the time.

THE last (received) number of *Annales Hydrographiques*, contains details of the navigation of the Magellan Straits by the corvette *L'Atalante*, with tabulated meteorological observations made during the 13 days of the passage.

THE continuation of Adolph Schaubach's "Deutschen Alpen" (pp. 641 to 850) is brought up to the end of the Trias. The writer is Dr. H. Emmrich.

THE last number of the *Annales des Sciences Géologiques* contains a continuation of M. Oustalet's researches on the fossil insects of the Tertiaries of France. This second instalment of 112 pages is devoted to Aix-en-Provence.

THE recently published Report of the Department of Mines of Nova Scotia shows that the total produce during the year from collieries was 1,051,467 tons. Of these 264,000 tons were sold to the United States, 6,000 to Great Britain, 214,000 were used in Nova Scotia, and the rest were sold to Quebec, New Brunswick, Newfoundland, Prince Edward Island, West Indies, and South America.

A STAINED glass window has just been placed in the parish church of Folkestone to the memory of Dr. William Harvey, the discoverer of the circulation of the blood, who was born in the town in 1578. It is the gift of the medical profession, more than 3,000 of whom have contributed towards the cost.

IN view of the great economical value of the fur seals of Alaska, and of the importance of a thorough knowledge of their habits and movements, with reference to the command of the market of the world, it is proposed by the United States Treasury Department to send some one to the North Pacific Ocean for the purpose of obtaining materials for an exhaustive report on the subject. It will be remembered that these seals, almost to the number of millions, visit the St. George and St. Paul islands of the Pribylov group every summer season for the purpose of bringing forth their young, and that on this occasion a company chartered by the United States is allowed to capture 100,000 annually. What becomes of these seals after they leave the islands is entirely unknown, although congregated there in such numbers for several months. A few are taken in the spring and fall as they pass along the coast of British Columbia and Washington Territory, but whether these are related to the Pribylov army or not is uncertain. The same species is found to a limited extent on the Asiatic side of the ocean, but no very extensive captures are made. Should this commission be appointed, it is to be hoped that some of these problems may be solved, and that we may not remain longer in ignorance of the general natural history of so important an animal, which furnishes a revenue to the United States of about 300,000 dols. a year, while a profit of almost millions is made by the company which has charge of the interest.

THE additions to the Zoological Society's Gardens during the last week include a Vigne's Sheep (*Ovis vignei*), from Asia, presented by Capt. Archibald ; a Sambur Deer (*Cervus aristotelis*) and an Axis Deer (*Cervus axis*), from India, presented by the Hon. Justice Jackson ; two Cut-throat Finches (*Amadina fasciatus*) and two Paradise Whydah Birds (*Vidua paradisea*) from West Africa, presented by Lieut. J. H. Hearne, R.N. ; a Rufous-necked Weaver Bird (*Hyphantornis textor*) from West Africa, presented by Mr. Hincks ; two Negro Tamarins (*Midas ursulus*) from Rio de Janeiro ; a Common Rhea (*Rhea americana*) from Buenos Ayres ; a Brazilian Teal (*Querquedula brasiliensis*), and a Bahama Duck (*Pœcilonetta bahamensis*) from South America, purchased.

THE PHYSICAL HISTORY OF THE RHINE*

THE attempt to unravel geological history, as far as the stratified rocks are concerned, and all the igneous rocks connected with them, simply resolves itself into this :—an effort to realise the physical geography of different geological epochs, to make out the relations of the sea and of the land with its plains and mountains during these periods, the history of the rivers and lakes of the time, and to know as much as may be known of all the creatures and of all the vegetation which inhabited the water and the land.

I am now going to attempt to explain the history of that great historical river the Rhine. Every river has a definite history, if we could clearly make it out. Every river has had a beginning, and it is quite possible—if we have the skill—to find out when, by special changes in physical geography, such and such a river began to flow, and why it flows in such and such a direction.

In various publications I have attempted to show what is the history of some of the rivers of England ; as, for example, the history of the Severn and of the Thames, and I think I have been able to prove that the Severn is a much older river than the Thames ; and, on similar principles, I now propose to attempt to reveal to you the history of the Rhine and its

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* A Lecture delivered at the Royal Institution on Friday evening, March 27, by Prof. A. C. Ramsay, L.L.D., V.P.R.S., Director-General of the Geological Survey of the United Kingdom, &c.